

**ENHANCEMENT OF MANCHESTER ENCODING TECHNIQUE  
BY COMBINING IT WITH A HASH FUNCTION**

A dissertation submitted to the Faculty of Information Technology  
in partial fulfillment of the requirements for the degree  
Master of Science (Information Technology)  
Universiti Utara Malaysia

By

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**ENHANCEMENT OF MANCHESTER  
ENCODING TECHNIQUE BY COMBINING IT  
WITH A HASH FUNCTION**



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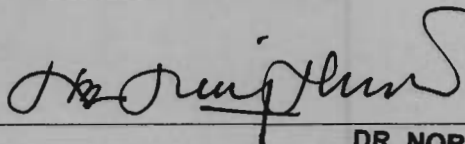
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## DEDICATION

In loving memory of my late father,

My great beloved mum,

My supportive and caring brothers,

My beloved kind sisters,

My sweetie nephews and nieces

My work is dedicated to all of you my heart residents

## ABSTRACT

This study proposes a combination of Manchester encoding technique and SHA-1 hash function, to provide a secure data transmission over a client/server environment by sending the message digest along with the message, and compare it with a new generated message digest on the server. Hash function improves integrity to the transmitted message. Manchester encoding technique is chosen to encode the transmitted message because it encodes both data and clocks into a form of synchronous bit stream. The modification of the message during the transmission, results in changing the message digest. This shows that including the SHA-1 hash function with Manchester encoding technique the integrity of the data can be accomplished.

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# TABLE OF CONTENTS

PERMISSION TO USE .....	i
DEDICATION .....	ii
ABSTRACT .....	iii
ACKNOWLEDGMENT .....	iv
TABLE OF CONTENTS .....	v
LIST OF FIGURES .....	viii
LIST OF TABLES .....	ix
ABBREVIATIONS .....	x
CHAPTER ONE .....	1
INTRODUCTION .....	1
1.1 Preamble.....	1
1.2 Problem Statement .....	3
1.3 Research Questions .....	4
1.4 Research Objectives .....	4
1.5 Scope of the Research .....	5
1.6 Significance of the Research.....	5
1.7 Research Structure .....	5
CHAPTER TWO .....	6
LITRERATURE REVIEW .....	6
2.1 Introduction .....	6
2.2 Data Transmission.....	6
2.3 Transmission Modes .....	7
2.4 Encoding Techniques .....	8
2.4.1 Differential .....	8
2.4.2 Return to Zero (RZ) .....	9
2.4.3 Non Return to Zero (NRZ).....	9
2.4.4 Manchester Encoding.....	10
2.4.4.1 Comparison between Manchester Encoding and Non-Return-to-Zero	12
2.4.4.2 Why Manchester Encoding? .....	13
2.4.4.3 The Advantages of Manchester Encoding Technique .....	14



2.5	Hash Function .....	15
2.5.1	The Use of Hash Function.....	16
2.5.2	Requirements for Hash Function .....	18
2.5.3	Hash Functions.....	21
2.5.3.1	Message Digest 2 (MD2) .....	21
2.5.3.2	Message Digest 4 (MD4) .....	21
2.5.3.3	Message Digest 5 (MD5) .....	21
2.5.3.4	WHIRLPOOL .....	22
2.5.3.5	RIPEMD.....	23
2.5.3.6	HAVAL.....	23
2.5.3.7	Secure Hash Algorithm 1 (SHA-1).....	24
2.6	Why SHA-1?.....	24
2.7	Summary .....	26
CHAPTER THREE.....		27
RESEARCH METHODOLOGY .....		27
3.1	Introduction .....	27
3.2	Process Steps.....	29
3.2.1	Awareness of Problem Phase.....	29
3.2.2	Suggestion Phase.....	30
3.2.3	Development Phase.....	31
3.2.4	Testing Phase .....	32
3.2.5	Conclusion Phase .....	32
3.3	Summary .....	32
CHAPTER FOUR.....		33
FINDINGS AND RESULTS .....		33
4.1	Introduction .....	33
4.2	System Architecture .....	33
4.3	System Model .....	36
4.4	System Requirements.....	37
4.4.1	Hardware Requirements.....	37
4.4.2	Software Requirement.....	37
4.5	Results .....	38
4.6	Summary .....	38
CHAPTER FIVE.....		40
CONCLUSION .....		40
5.1	Conclusion .....	40

5.2	Research Contribution.....	41
5.3	Strengths and Weaknesses .....	41
5.3.1	Strengths.....	41
5.3.2	Weaknesses .....	41
5.4	Future Work .....	42
	References .....	43
	APPENDICES .....	48
	Appendix A: Flow Chart.....	49
	Appendix B: Prototype Testing and Screen Captures.....	54

# LIST OF FIGURES

Figure 1.1: Modification of the Message .....	2
Figure 2.1: Differential Encoding .....	8
Figure 2.2: Return to Zero.....	9
Figure 2.3: Non Return to Zero.....	9
Figure 2.4: The Wave Form for a Manchester Encoded Bit Stream.....	11
Figure 2.5: Binary Values for NRZ and Manchester Codes .....	13
Figure 2.6: General Hash Function .....	15
Figure 2.7: Iterative Cryptographic Hash Function Model.....	16
Figure 2.8: Digital Signature.....	19
Figure 2.9: FIPS Digital Signature Standard (DSS) Using SHA-1 Hash Function .....	20
Figure 3.1: The General Methodology of Design Research .....	28
Figure 4.1: System Architecture .....	34
Figure 4.2: Manchester Encoding and Decoding of the Passed Message.....	35
Figure 4.3: Produce, Encrypt and Decrypt the Message Digest for the Passes Message ....	35
Figure 4.4: Produce the Message Digest for the Passes Message in the Receiver Side .....	36
Figure 4.5: Comparing the Received Message Digest with the Generated One.....	36
Figure 4.6: System Model.....	36
Figure 1: MET Encoding for the Entered Message at the Client.....	50
Figure 2: Generate Message Digest at the Client.....	51
Figure 3: Decode the Received Message at the Server.....	52
Figure 4: Generate Message Digest on the Server and Compare it with the Received One	53
Figure 1: Establishing a Connection with the Server.....	55
Figure 2: Connection Refused.....	56
Figure 3: Enter Message.....	57
Figure 4: Prompt the Client to Enter a Message .....	57
Figure 5: Send Message without Noise.....	58
Figure 6: Binary, MET and Message Digest for the Sent Message.....	58
Figure 7: Server Window for the Received Message without Noise .....	59
Figure 8: Send Message with Noise.....	60
Figure 9: Server Window for the Received Message with Noise .....	61
Figure 10: Retransmit the Message.....	61

## LIST OF TABLES

Table 2.1: Manchester Encoding Table .....	14
Table 2.2: A Comparison between the Mentioned Hash Functions .....	25

## ABBREVIATIONS

MET	Manchester Encoding Technique
SHA-1	Secure Hash Algorithm 1
DC	Direct Current, <i>Continuous</i> Current
MAC	Message Authentication Code
HMAC	Keyed-Hash Message Authentication Code
DTE	Data Terminal Equipment
EBCDIC	Extended Binary Coded Decimal Interchange Code
ASCII	American Standard Committee for Information Interchange
DPLL	Digital Phase Locked Loop
DSS	Digital Signature Standard
NIST	National Institute of Standards and technology
DSA	Digital Signature Algorithm
FIPS	Federal Information Processing Standards

# CHAPTER ONE

## INTRODUCTION

### 1.1 Preamble

With the introduction of the computer and the advent of computer networks, the need for protecting information becomes more important. The transmitted data through the open networks may fall into wrong hands or get altered without the knowledge of senders or receivers of the message (Dahlin & Krantz, 2001).

In recent years, automated tools were required for protecting sensitive data from flowing over these networks. Cryptography came as a clear answer to all these concerns.

Large amounts and various types of data are transferred through hundred of networks daily. This data is subjected to hacking during its transmission through networks as shown in Figure 1.1. An example is the client/server system where client sends data to the server and vice versa (Stallings, 2006b).

The contents of  
the thesis is for  
internal user  
only

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